City of New Haven
Community Clean Air Initiative

Developing a Local HAP Inventory & Reduction Strategy in New Haven

Madeleine R. Weil

EPA Science Forum 2004

Project Purpose

(1) Develop an inventory of local HAP emissions from point, area and mobile sources

(2) Design and implement an air toxic reduction strategy focused on priority pollutants and sources identified by the inventory

New Haven All-America City 2003

New Haven Background

- Land Area
~19 square miles

- Population
~124,000

New Haven Green

–21% poverty

–64% racial/ethnic minority

New Haven Background

- Completed Greenhouse Gas Inventory in 2001 - Cities for Climate Protection Campaign (ICLEI)
- HAP emissions New Haven County 2nd highest in New England - 1996 NATA
- Mix of point, area, mobile sources in close proximity to neighborhoods

New Haven
All-America City
2003

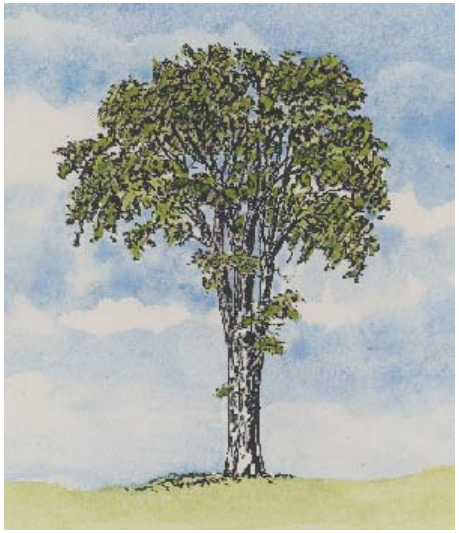
Project Background

- 2002 Air Toxics Inventory grant from EPA New England - $80K
  - Multiple source categories
  - Community stakeholders
  - Bottom-up where possible
- City Plan & Health Departments

New Haven All-America City 2003

Other Context

Comprehensive Plan of Development
Fall 2003



- Emphasizes environmental health & sustainability as components of quality of life
- Provides guidance for development policies and regional planning initiatives
- Environmental justice

New Haven All-America City 2003

Primary Questions

- What sources are responsible for hazardous air pollutant emissions?
- What are the pollutants of concern?
- Where are there concentrations of hazardous air pollutants?

How can this information be used to reduce health risk in New Haven?

Secondary Questions

- How accessible are air toxics data to local governments lacking inventory expertise?
- Where would the technical and systemic challenges lie in gathering data?
- What innovative methods would result from a “rookie” project?

What are the advantages/disadvantages of local inventory development?

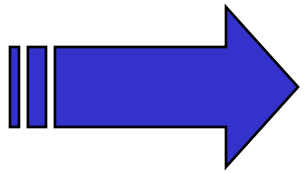
Inventory Discussion

- Point, Area and Mobile sources
  - Methods
  - Results
  - Lessons

Point Source: **Methods** Results Lessons

- Inventoried individually (only one "major" HAP source)

- 1999 NEI Draft 2
- 2000 TRI
- CT DEP 2000 Air Inventory (Speciated)



Draft Point Source Data Submitted to Facility Managers

New Haven All-America City 2003

Point Source: **Methods** ✍ Results ✍ Lessons

- 16/33 facilities responded with revised data: 211 to 114 TPY emissions. Comments:

NEI data out of date

TRI category averages misrepresent actual emissions

New Haven All-America City 2003

Point Source: Methods ✍ **Results** ✍ Lessons

- 114 tons total HAPS
  - surface coating
  - degreasing
  - petro tank farms
  - power plants
- 13/33 facilities = 96% emissions

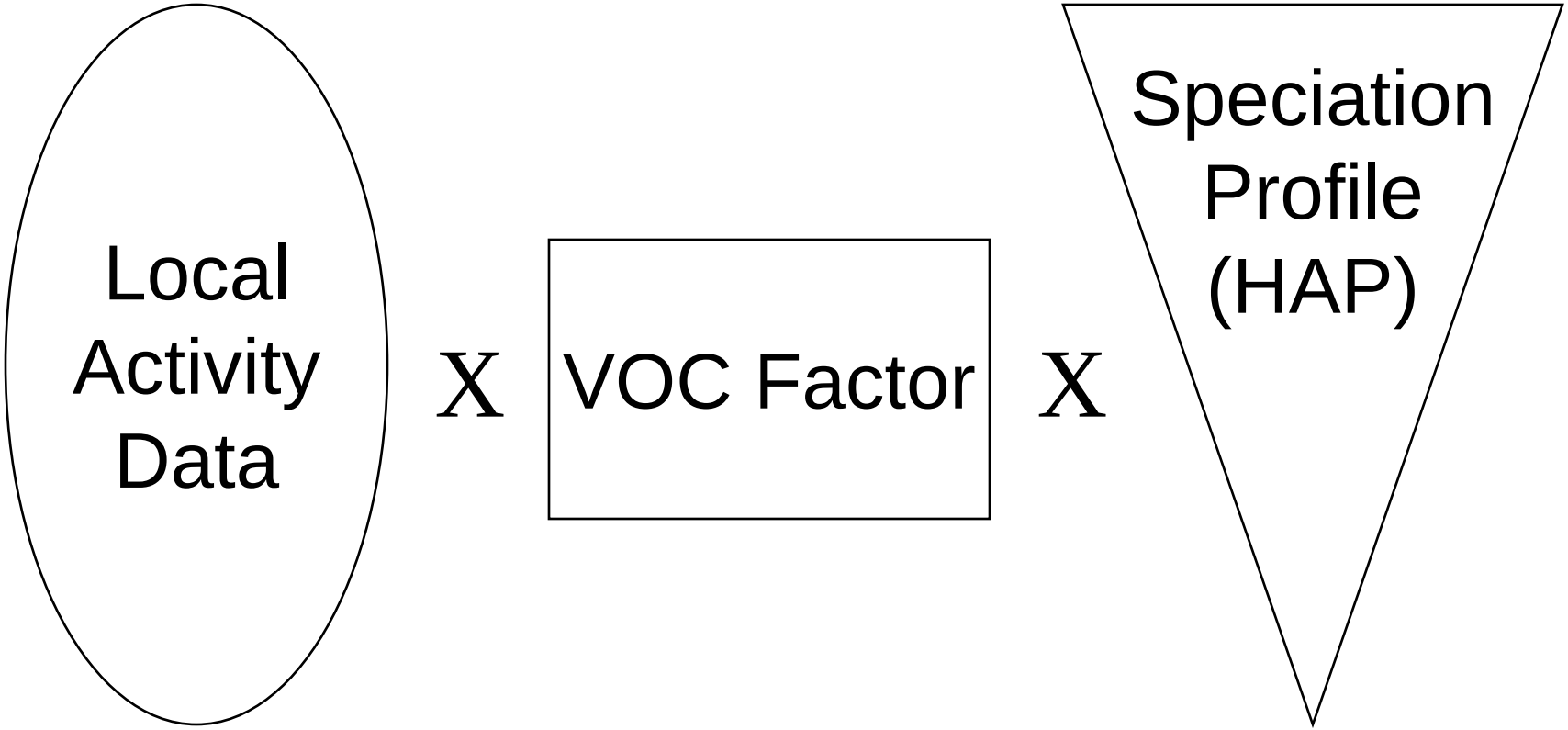
New Haven All-America City 2003

Point Source: Methods ✍ Results ✍ **Lessons**

- Up-front NEI training would help
- Existing inventories inconsistent
- CT lacked HAP inventory
- Highlighted the importance of partnership with record-keeping staff at regulatory agencies

New Haven All-America City 2003

Area Source: **Methods** ✍ Results ✍ Lessons



New Haven All-America City 2003

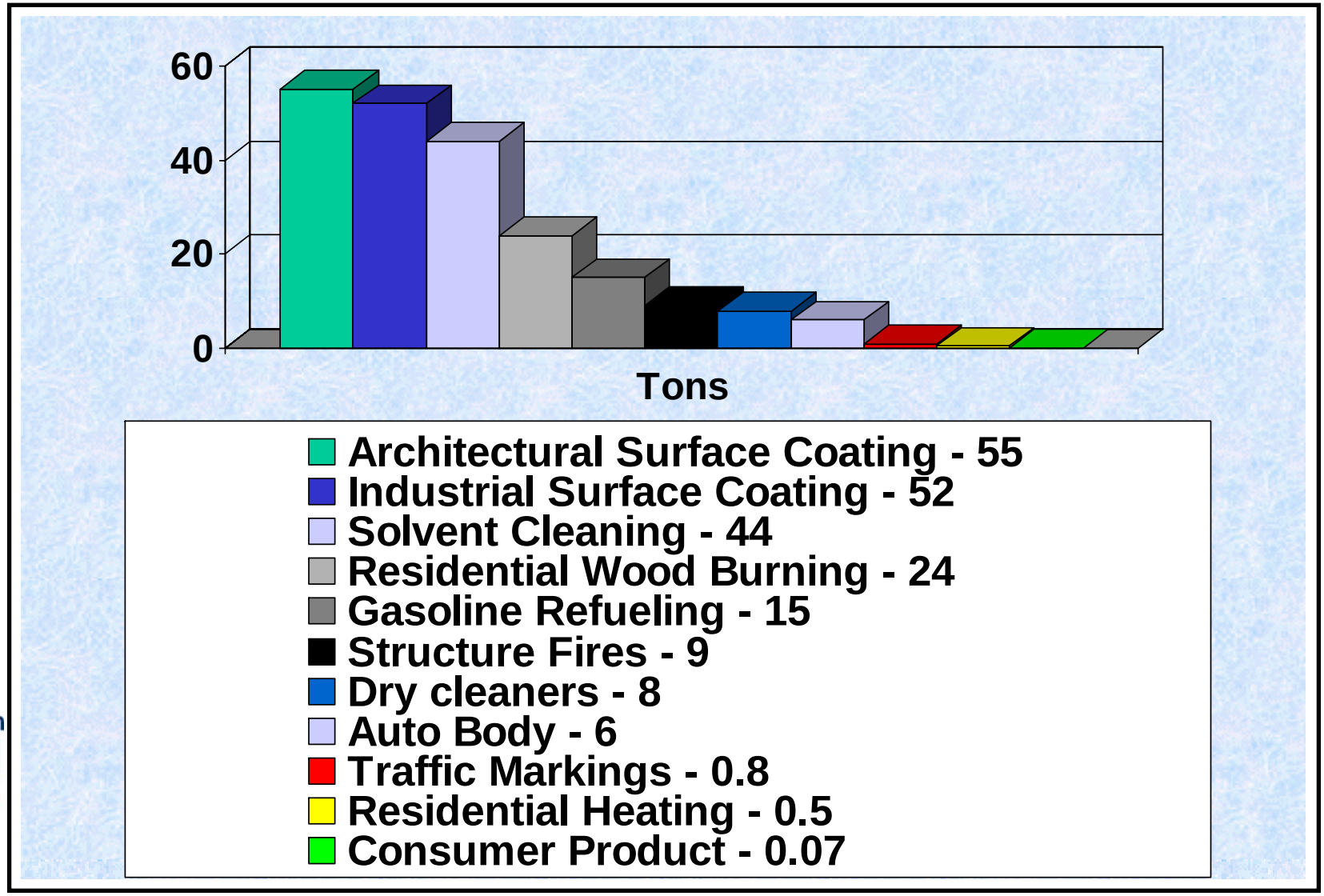
= HAP Emissions

Area Source: **Methods** Results Lessons

- Surveys: Gas Refueling Stations, Dry Cleaners, Printers, Auto Body
- Experts: Structure Fires, Traffic Markings, Res. Heating Oil
- Utility Requests: Res. Natural Gas
- Existing Research: Res. Wood Burning
- Per Capita: Architectural surface coating, consumer product usage
- Per Employee: Solvent cleaning, industrial surface coating

New Haven All-America City 2003

Area Source: Methods ✍ **Results** ✍ Lessons



New Haven All-America City 2003

Area Source: Methods ✍ Results ✍ **Lessons**

- Groundwork improves accuracy of activity data
- But method still relies on EPA emission factors
- Developed for national-level inventories

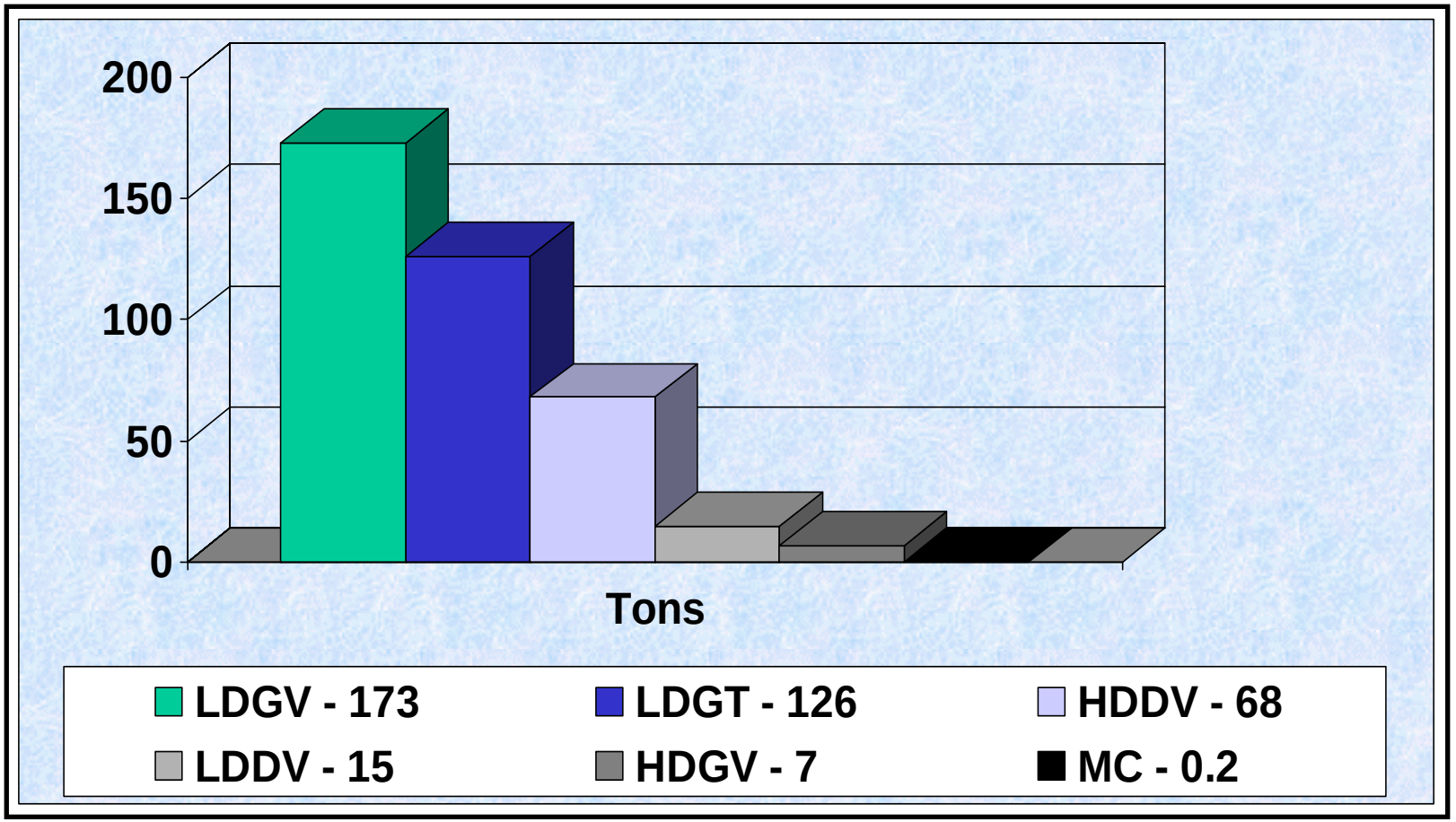
New Haven All-America City 2003

Mobile Onroad: **Methods** ✍ Results ✍ Lessons

- Mobile 6.2. considered…would have been first sub-county run
- 1999 NEI county-level emissions apportioned to City using VMT ratios
- Other variables: vehicle mix, traffic patterns and speed?
- Local vehicle classification mix established from CTDOT traffic counts

New Haven All-America City 2003

Mobile Onroad: Methods ✍ **Results** ✍ Lessons



New Haven
All-America City
2003

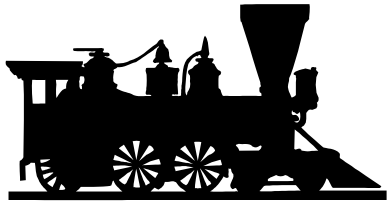
Mobile Onroad: Methods ✍ Results ✍ **Lessons**

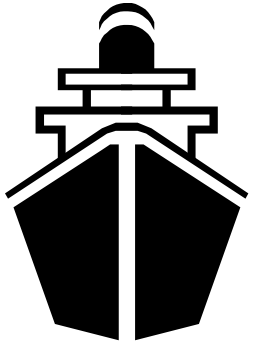
- HDDV emissions underestimated?
- High ambient levels of PM2.5 recorded
- Port-related traffic: idling trucks, slow speeds, heavy loads

New Haven All-America City 2003

Mobile Nonroad: **Methods** ✍ Results ✍ Lessons

- Aircraft: LTO data
- Locomotives: Fuel consumption data
- Commercial Marine Vessels: Waterborne Commerce Statistics





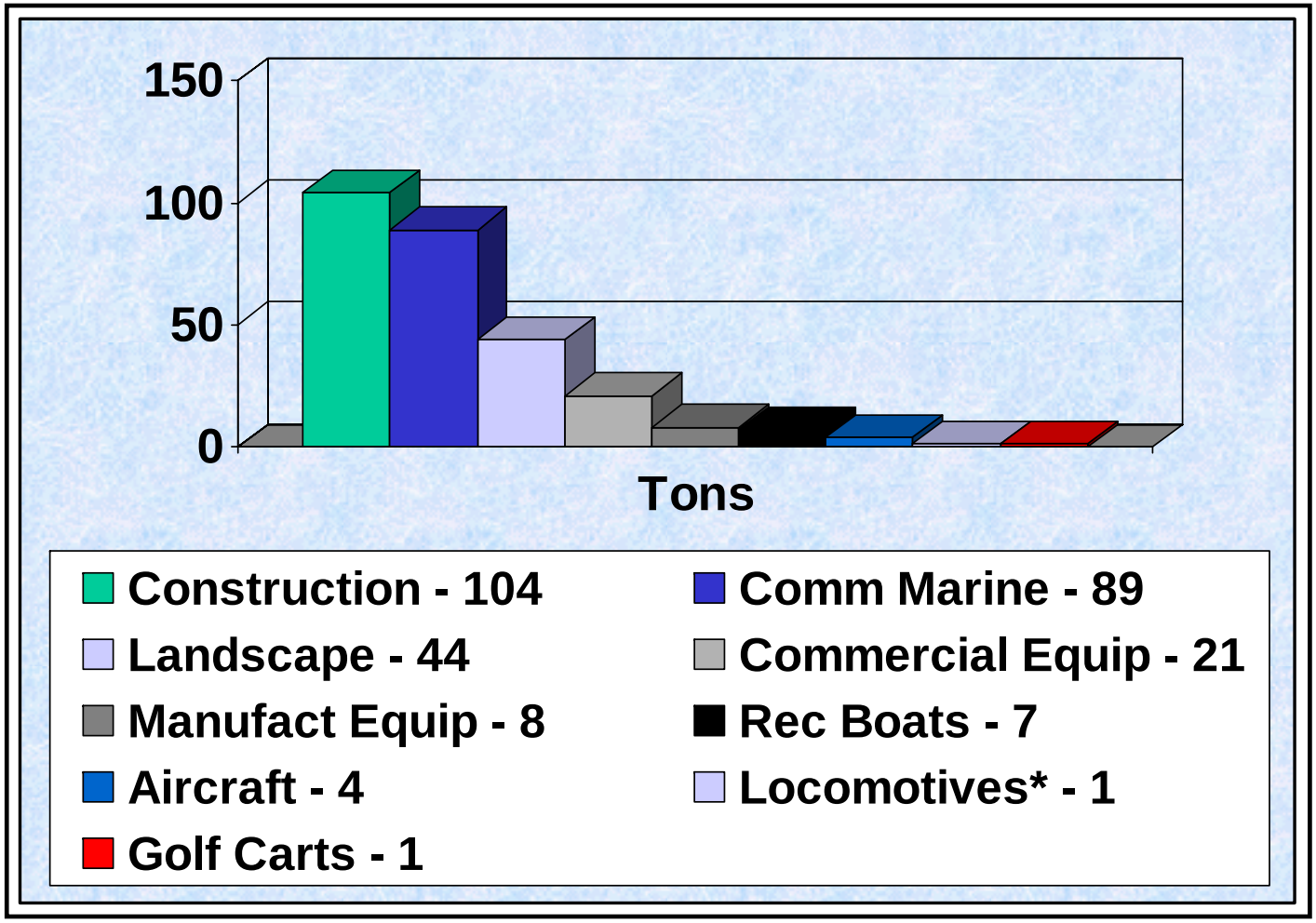
New Haven All-America City 2003

Mobile Nonroad: **Methods** ✍ Results ✍ Lessons

Industrial Equipment	Personal Landscape Equipment	Commercial Landscape Equipment	Golf Equipment
Construction Equipment	Commercial Equipment	Recreational Boats	Railway Maintenance Equipment

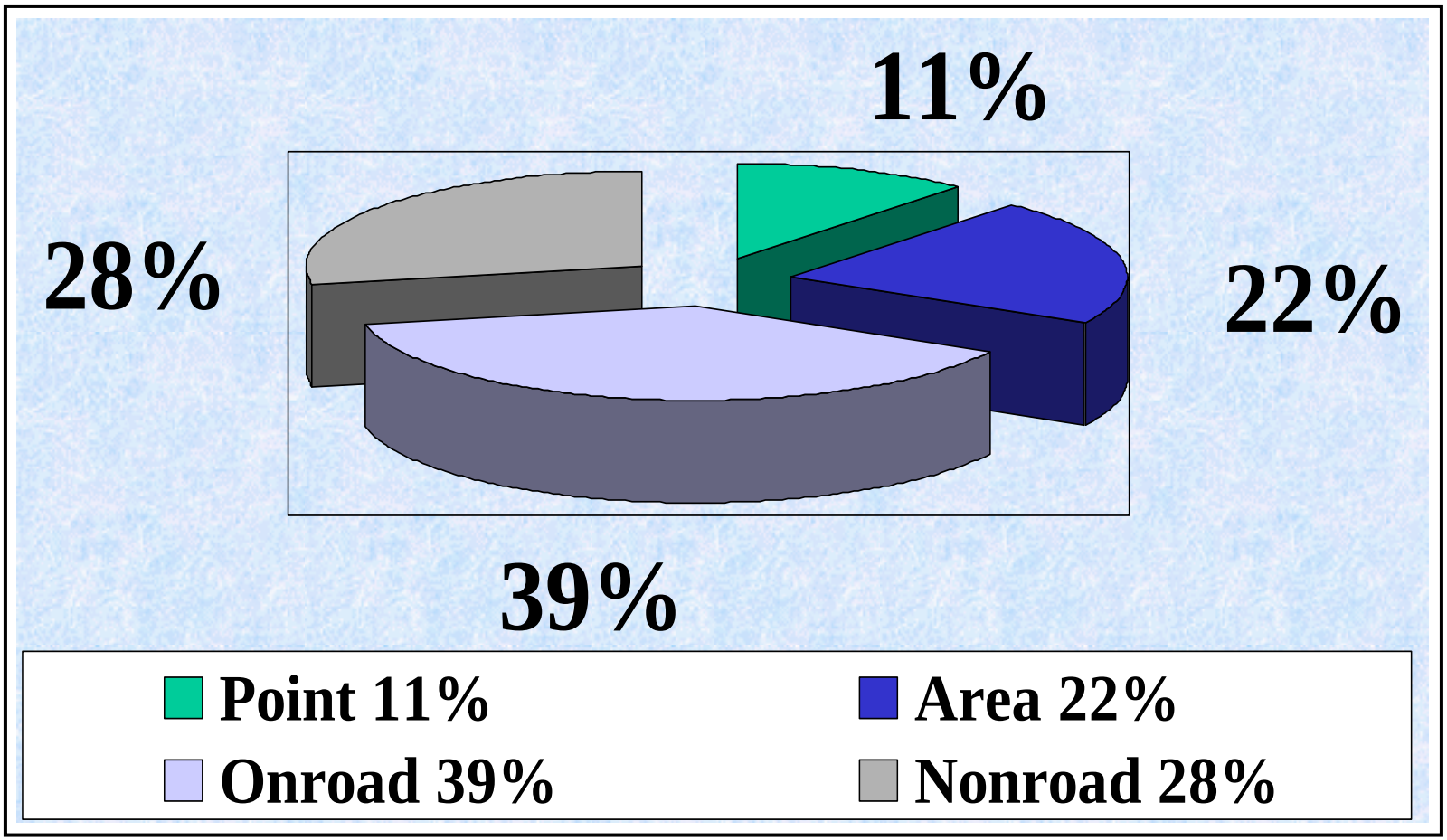
- NEI County data apportioned to City using local activity data

Mobile Nonroad: Methods ✍ **Results** ✍ Lessons



New Haven
All-America City
2003

Inventory Results: By Source Category



Total HAPS = 997 tons
116 pollutants & groups

New Haven All-America City 2003

Health Risk Prioritization

- Toxicity Weight Screening Approach
- Evaluates relative risk – based on emissions and toxicity
- Cancer, chronic and acute health risk
- Focus reduction strategy on high ranking pollutants

New Haven All-America City 2003

Emissions vs. Health Risk

Emissions

- **Diesel PM**
- Toluene
- Xylene
- MTBE
- **Benzene**
- **2,2,4-TMP**
- **Formaldehyde**
- Methyl Chloro
- Ethyl Benzene
- N-Hexane

Health Risk

- **Diesel PM**
- POM
- Acrolein
- **2,2,4-TMP**
- **Formaldehyde**
- Dioxin
- **Benzene**
- Chromium
- 1,3-Butadiene
- Propionaldehyde

New Haven All-America City 2003

New Haven Priority Pollutants

- Diesel PM
- POM
- Acrolein
- 2,2,4-Trimethylpentane
- Formaldehyde
- Dioxin
- Benzene
- Chromium
- 1,3-Butadiene
- Propionaldehyde

New Haven All-America City 2003

Risk Ranking Lessons

- Assistance from toxicologists & air pollution experts essential
- Health-risk analysis must follow inventory development
- If risk reduction strategy is to reflect risk, not emissions

Risk Reduction Strategy

1. Mobile, Stationary, Indoor
    1. Ability to reduce health risk
    2. Feasibility
2. EPA Healthy Communities Grant 2003 - $50K
3. Community stakeholder group

Mobile Sources

- Diesel Vehicles: Early adoption of ULSD public & private fleets, school bus / transit bus retrofits, anti-idling, construction equipment emission control
- Passenger Vehicles: CAL LEVII standards, VMT reduction through transportation alternatives & smart growth

New Haven
All-America City
2003

Stationary Sources

- Gas stations (POM): Stage II vapor recovery compliance, topping off outreach
- Fossil fuel combustion: demand-side energy efficiency, renewable energy development

Indoor Air Toxins

- EPA Smoke-Free Pledge outreach: indoor tobacco smoke
- Tools for Schools pilot project
- Environmentally friendly cleaning products for New Haven Public Schools

New Haven All-America City 2003

Reduction Strategy Lessons

- Dove-tail with other priorities: climate change, PM2.5 compliance, environmental justice
- Pre-existing constituencies
- “Big-Tent” approach leverages City’s power to catalyze change

Stakeholder Group

- EPA
- CT DEP
- Health Department
- Asthma Initiative
- Environment NE
- CT Fund for the Environment
- NESCAUM
- NH EJ Network
- Aldermen
- Yale University
- PSE&G (operator local power plant)
- Arts & Ideas Festival
- Congresswoman DeLauro's Office

New Haven All-America City 2003

Note: stakeholders more engaged in risk reduction than inventory development

Conclusions

Inventory Development:

(1) Raised awareness in the community and at City Hall

(2) Established the City as a stakeholder in air pollution issues

More Conclusions

Inventory Development:

(3) Bestowed legitimacy on reduction measures

(4) Established baseline against which to measure reductions

More Conclusions

Inventory Development:

(5) Leveraged complementary campaigns – climate change, environmental justice, etc.

Final Thoughts

(1) Without modeling results & monitoring data, we can't be certain that bottom-up methods resulted in a more accurate inventory.

New Haven All-America City 2003

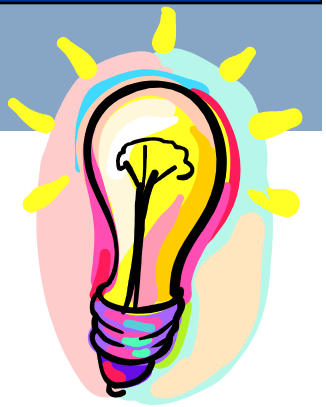
Final Thoughts

(2) Cleveland's risk reduction strategy addresses same source categories, yet approach was different.

Reveals a) a common emissions profile and/or b) common implementation strategies feasible at the local level.

New Haven All-America City 2003

Final Thoughts



(3)Process has emphasized zoning/siting concerns at the local level.

- Cumulative effects of cluster zoning?
- EJ implications of sensitive receptor sites near highways?
- What are the City's responsibilities, now that this info is available?

New Haven All-America City 2003

Final Thoughts

(4) Some threats can not effectively be addressed through voluntary measures at the local level, but require legislation & technology diffusion efforts at the state and federal levels. New Haven's long-term strategic objectives now include advocacy and coalition building on issues once considered outside the municipal purview.

New Haven All-America City 2003

City of New Haven
Community Clean Air Initiative

Madeleine R. Weil
Mweil@newhavenct.net
203-946-6752